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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellant : Andrew LILBURN Confirmation No.: 7601  
Appln. No. : 10/050,167 Group Art Unit: 1731  
Filed : January 18, 2002 Examiner: S. Alvo  
For : PROCESS AND APPARATUS FOR MONITORING DEWATERING  
IN A WET SECTION OF A PAPER MACHINE

**APPEAL BRIEF UNDER 37 C.F.R. § 1.192**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This appeal is from the Examiner's final rejection of claims 1 - 33, as set forth in the Official Action of December 2, 2003.

A Notice of Appeal in response to the December 2, 2003 Final Office Action was filed March 2, 2004, and the statutory due date for filing the brief is May 3, 2004 (May 2, 2004 being a Sunday).

The requisite fee under 37 C.F.R. 1.17(f) in the amount of \$ 330.00 is being paid by check, submitted herewith. However, if for any reason the necessary fee is not associated with this file or the concurrently filed Request for Extension of Time is not found, the Commissioner is authorized to charge the appeal fee and any necessary extension of time fees to Deposit Account No. 19 - 0089.

This appeal brief is being submitted in triplicate, pursuant to 37 C.F.R. 1.192(a).

**(1) REAL PARTY IN INTEREST**

The real party in interest is Voith Paper Patent GmbH by an assignment recorded in the U.S. Patent and Trademark Office on January 18, 2002 at Reel 012505 and Frame 0581.

**(2) RELATED APPEALS AND INTERFERENCES**

No related appeals and/or interferences are pending.

**(3) STATUS OF THE CLAIMS**

Claims 1 - 33 stand finally rejected, and claims 34 - 49, directed to the non-elected invention, have been withdrawn from further consideration by the Examiner. Moreover, concurrently herewith, Appellant is submitting an amendment to cancel withdrawn claims 34 - 49, directed to the non-elected invention, without prejudice or disclaimer.

Accordingly, only claims 1 - 33, which stand finally rejected, are reproduced in the Appendix following this appeal brief.

**(4) STATUS OF THE AMENDMENTS**

No amendments were made to the claims subsequent to the December 2, 2003 Final Office Action. However, concurrently herewith, Appellant submits an Amendment Under 37 C.F.R. 1.116 in order to cancel without prejudice or disclaimer claims 34 - 49, directed to the non-elected invention.

**(5) SUMMARY OF THE INVENTION**

The present invention is directed to a process for monitoring dewatering in a wet end section of a paper machine, and, in particular, in the press section. According to the invention, the water balance of the press section is used to determine web consistency/dryness after the press. To determine the water balance, the water flow rate (in gallons per minute (gpm)) into ( $W_{in}$ ) and out of ( $W_{out}$ ) the press section are measured, e.g., with flow meters, such as inductive flow meters, weir overflow boxes, etc., as is the conductivity into ( $C_{in}$ ) and out of ( $C_{out}$ ) the press section (in micro mhos ( $\mu\Omega$ )). (Specification, paragraph [0016]). The water of the wet web can be determined, e.g., by gamma gauge and calculation, and the shower water is measured to determine water flow into the press section, and water flow into the felt suction boxes, e.g., Uhle boxes, and the press water from the press is measured to determine the water out of the press section. Further, by measuring the conductivity of the wet web, which is essentially the same as the headbox conductivity, and the conductivity of the shower water, the conductivity into the press section is determined, and by measuring the conductivity of the water from the felt suction boxes, e.g., Uhle boxes, by, e.g., an in-line meter, and from the press, the conductivity out of the press section is determined. (Specification, paragraph [0017]). Further, the instant invention utilizes the finding that conductivity versus dissolved solids is linear at paper making pHs, such that (conductivity x flow) is additive, i.e., a specific mixture

of two different conductivities has only one possible conductivity. (Specification, paragraph [0018]).

Therefore, according to an exemplary embodiment of the instant invention, the process includes measuring water flowing into the wet end section, measuring water flowing out of the wet end section, detecting conductivity of the wet web entering the wet end section, measuring conductivity of the water flowing into wet end section, measuring conductivity of water flowing out of the wet end section, and determining a water balance from the measured quantities, which is indicative of dewatering in the wet end. (Specification, paragraph [0034]).

Further, the above-noted exemplary process is performed in a wet end section of a web production machine, and, in a specific embodiment, in the press section 1 of such a machine. (Specification, paragraph [0056]; and Figure 1). The press section can include a plurality of presses 2, 3, and 4 arranged to dewater the web. In press 2, the web is sandwiched between felt 23 and another felt 25 so that water pressed out of the web can be absorbed by felts 23 and 25, and water removed in press 2 is collected in press pan 29. After press 2, the web and felt 23, which separate from felt 25, are guided over press roll 21 to press 3, and felt 25 is deflected toward a guide roll 28. En route to guide roll 28, felt 25 is guided past a shower 20, arranged to clean/condition the felt, and a suction device 31, e.g., a Uhle box, arranged to remove excess water. Moreover, conductivity sensors 50 are coupled

to suction device 31, shower 20, and press pan 29. (Specification, paragraph [0056]; and Figure 1).

Water pressed out of the web in press 3 can be absorbed by felt 23, and water removed is collected in press pan 39. After press 3, felt 23 separates from the web, and the web is picked up by roll 32, and felt 23 is guided back to pick up roll 24. Along the path back to pick up roll 24, felt 23 is guided past a shower 36, arranged to clean/condition the felt, and a suction device 37, e.g., a Uhle box, arranged to remove excess water from felt 23. Again, conductivity sensors 50 are coupled to suction device 37, shower 36, and press pan 39. (Specification, paragraph [0057]; and Figure 1).

The web is guided through press 4 so that water pressed out of the web can be absorbed by felt 33, and water removed in press 4 is collected in press pan 45. After press 4, the web is transferred to felt 33, and the web and felt 33 are separated at deflection roll 40. As felt 33 is guided along a path from the exit of press 4 to deflection roll 41, felt 33 is guided past a shower 43, arranged to clean/condition the felt, and a suction device 44, e.g., a Uhle box, arranged to remove excess water from felt 33, and conductivity sensors 50 are coupled to suction device 44, shower 43, and press pan 45. (Specification, paragraph [0058]; and Figure 1).

Control unit 100 is coupled to receive information directed to the flow and conductivity of the water in press pan 39 and Uhle box 37. By analyzing the water balance

as discussed above, a determination can be made with regard to actuating and/or adjusting shower 36 to clean felt 23, and with regard to adjusting the vacuum strength or slot sizes in Uhle box 37. Moreover, control unit 101 is coupled to receive information directed to the flow and conductivity of the water in press pan 29 and Uhle box 31, and control unit 102 is coupled to receive information directed to the flow and conductivity of the water in press pan 45 and Uhle box 44. Further, a control unit 103 is coupled to control units 100, 101, and 102, as well as to a conductivity sensor in the headbox to compile the information for the press section. (Specification, paragraphs [0059] - [0060]; and Figure 1).

During the operation of the machine, the dewatering process can be monitored. Web consistency and dryness after the press are determined from the water balance of press section 1. In order to determine the water balance, the water flow rate (in gallons per minute (gpm)) into ( $W_{in}$ ) and out of ( $W_{out}$ ) press section 1 is measured, e.g., with flow meters, such as inductive flow meters, weir overflow boxes, etc., as is the conductivity into ( $C_{in}$ ) and out of ( $C_{out}$ ) the press section (in micro mhos ( $\mu\Omega$ )). It is noted that weir overflow requires an accurate measurement of height, e.g., via a modification of notch to minimize sensitivity, correctly sized/designed collection boxes, resistivity vs. height, pressure vs. height, laser position measurement, ultrasonic position measurement, etc. (Specification, paragraph [0061]; and Figure 1). Water of the wet web can be determined, e.g., by a gamma gauge and calculation, and the shower water utilized in press section 1 can be measured to determine

the water into the press section, whereas water flow into Uhle boxes 31, 37, and 44 for each felt in press section 1, and the press water collected in press pans 29, 39, and 45 of press section 1 is a measurement of water out of press section 1. The conductivity into press section 1 is measured from the conductivity of the wet web (which is essentially the same as the headbox conductivity) and the conductivity of the shower water in showers 27, 36, and 43, and the conductivity out of the press section is measured from the conductivity of the water collected in Uhle boxes 27, 37, and 44 and from the conductivity of the press water in press pans 39, 39, and 45. (Specification, paragraph [0062]; and Figure 1).

According to the invention, conductivity versus dissolved solids is linear at paper making pHs, i.e., in the absence of free mineral acidity or hydroxide alkalinity. As such, conductivity x flow is additive, i.e., a specific mixture of two different conductivities has only one possible conductivity. For example, 1 gallon at  $500 \mu\text{S}$  + 1 gallon at  $1500 \mu\text{S}$  = 2 gallons at  $1000 \mu\text{S}$ . (Specification, paragraph [0064]). Thus, utilizing the above-noted flow rates and conductivities, water flow ( $W_{\text{in}}$ ) x conductivity ( $C_{\text{in}}$ ) into the press section is determined, as is water flow ( $W_{\text{out}}$ ) x conductivity ( $C_{\text{out}}$ ) out of the press section. (Specification, paragraph [0065]; and Figure 1). Moreover, water balancing equations for determining exit sheet flow and exit sheet dryness are set forth in paragraphs [0067] - [0072].

In a further embodiment, cross-direction water removal profile can be monitored through the use of a sectioned Uhle box 31' or 31". (Specification, paragraph [0078]; and

Figures 2 or 2A). Further, a sectioned press pan 39' can be utilized in monitoring cross-direction water removal profile. (Specification, paragraph [0079]; and Figure 3).

**(6) ISSUES**

**(A) Whether Claims 1 - 6, 18, and 31 are Improperly Rejected Under 35 U.S.C. § 103(a) as Unpatentable Over WO00/08462 [hereinafter "LILBURN"];**

**(B) Whether Claims 7 - 17, 19 - 30, and 32 are Improperly Rejected Under 35 U.S.C. § 103(a) as Unpatentable Over LILBURN in view of LEWIS (U.S. Patent No. 5,093,795), with or without JUSTUS (U.S. Patent No. 3,185,617) or ELY, Sr. (U.S. Patent No. 3,268,390) [hereinafter "ELY"]; and**

**(C) Whether Claim 33 is Improperly Rejected Under 35 U.S.C. § 103(a) as Unpatentable over LILBURN in view of BOSSEN (U.S. Patent No. 3,655,980).**

**(7) GROUPING OF CLAIMS**

For the purpose of this appeal, Appellant submits that, for the claims rejected over LILBURN alone (Issue A), claims 1, 4, and 5 stand or fall together, while claims 2, 3, 6, 18, and 31 are separately patentable, and, therefore, do not stand or fall together. Further, for the claims rejected over LILBURN in view of LEWIS, JUSTUS, or ELY, Sr. (Issue B), claims 7 - 17, 19 - 30, and 32 are separately patentable, and, therefore, do not stand or fall together. Claim 33, which is rejected over LILBURN in view of BOSSEN, is separately patentable and does not stand or fall with any other claim. Support for the separate patentability of the

identified claims is set forth hereinbelow.

(8) **ARGUMENT**

**(A) The Rejection of Claims 1 - 6, 18, and 31 Under 35 U.S.C. § 103(a) Over LILBURN is in Error, the Rejection Should be Reversed, and the Application Should be Remanded to the Examiner.**

The Examiner asserts that LILBURN discloses measuring water flowing into the wet end section, measuring water flowing out of the wet end section, detecting conductivity of the wet web entering the wet end section, determining conductivity of the water flowing into the wet end section through water sprayers, determining conductivity of water flowing out of the wet end section in press pans, and determining a material balance from the measured quantities. The Examiner also asserts that the press of LILBURN is located in the wet end section. Appellant traverses the Examiner's assertions.

Appellant's independent claim 1 is directed to a process for monitoring dewatering in a wet end section of a web production machine, that recites, *inter alia*, measuring water flowing into the wet end section, measuring water flowing out of the wet end section, *detecting conductivity of the wet web entering the wet end section*, measuring conductivity of the water flowing into wet end section, measuring conductivity of water flowing out of the wet end section, and determining a water balance from the measured quantities, which is indicative of dewatering in the wet end.

As Appellant noted in the previous response, the *Background of the Invention* section of the instant application sets forth that LILBURN, while disclosing calculating wet web flow, does so with the *solids content of the wet web* and its *conductivity in front of the press* being unknown. That is, in LILBURN, because conductivity of the web is measured from *the previous nips*, which are already *within* the wet section, the initial conductivity measurement is not made until *after* the first press. Accordingly, Appellant submits that LILBURN fails to teach or suggest detecting conductivity of the wet web *entering the wet end section*, as recited in at least independent claim 1.

While the Examiner has attempted to bolster his arguments by pointing out that LILBURN discloses a press in the wet end section, Appellant submits that this argument is not pertinent to the feature of independent claim 1 at issue. In other words, Appellant's independent claim 1 does not recite a process feature of detecting conductivity of the wet web *in front of a press* in the wet end section. Instead, and in contrast to the disclosure of LILBURN, Appellant's independent claim 1 recites, *inter alia*, detecting conductivity of the wet web *entering the wet end section*.

Moreover, in view of the foregoing, Appellant submits that the disclosure of LILBURN, not only fails to render obvious the recited feature of independent claim 1, but actually teaches against the feature of the instant invention. That is, LILBURN is directed to a process specially designed to calculate wet web flow without knowing the *solids content*

*of the wet web and/or its conductivity in front of the press.* Further, even assuming, *arguendo*, that one ordinarily skilled in the art were to find this modification obvious (which Appellant submits one would not), the asserted modification unnecessarily adds a detection step for no purpose that would further the LILBURN process.

Appellant submits that rejections based on 35 U.S.C. § 103 must rest on a factual basis with these facts being interpreted without hindsight reconstruction of the invention from the prior art. The Examiner has the initial duty of supplying the factual basis for the rejection and may not, because of doubt that the invention is patentable, resort to speculation, unfounded assumption or hindsight reconstruction to supply deficiencies in the factual basis. *See In re Warner*, 379 F.2d 1011, 1017, 154 USPQ 173, 177 (CCPA 1967). As stated in *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-313 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984):

[t]o imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.

In this regard, Appellant notes that it is apparent from LILBURN that the determination of the conductivity of the wet web is calculated from determinations made from previous nips, and that there is no teaching or suggestion of determining the conductivity of the wet web entering the wet end section. Moreover, as there is no teaching or suggestion in LILBURN that the conductivity of the wet web entering the first press nip

and exiting the first press nip is the same (which Appellants submits it is not), the LILBURN process will still be required to determine the conductivity of the wet web *after* the first (previous) nip as a basis for all subsequent calculations. Thus, Appellant submits that, in contrast to the Examiner's assertions, LILBURN fails to suggest of any benefit to determining the conductivity of the web entering the wet end section, as recited in at least independent claim 1.

As such, Appellant submits that the art of record fails to provide any motivation or rationale for modifying LILBURN in the above-noted manner, and, in fact, that the only reason to modify LILBURN in the manner asserted by the Examiner is found in reviewing Appellant's disclosure and through the use of impermissible hindsight.

While the Examiner asserts in the February 20, 2004 Advisory Action that Appellant is arguing limitations not in the claims, i.e., that the previous nip is in the wet end section of the machine, Appellant submits that this argument is directed to distinguishing the instant invention from LILBURN. That is, the "previous press nip" is an element of *LILBURN* (not the instant invention), after which, the conductivity of the LILBURN web is calculated. In contrast to LILBURN, the instant claims recite detecting conductivity of the wet web *entering* the wet end section, not after a press in the wet end section. Thus, Appellant submits that, as LILBURN fails to provide any teaching or suggestion of detecting the conductivity of the wet web *entering the wet end section*, as recited in at least independent

claim 1, this document fails to render unpatentable the present invention.

Accordingly, Appellant submits that LILBURN fails to teach or suggest the combination of features recited in at least independent claim 1, and likewise fails to suggest any obvious modifications to LILBURN that would render the instant invention unpatentable. Therefore, Appellant submits that the instant rejection is improper and should be withdrawn.

Further still, Appellant submits that even if it is considered that the prior art document has been properly modified, which Appellant submits it has not, the applied art fails to teach or suggest the other various recited features of the process, which are set forth in the dependent claims. In particular, Appellant submits that, as LILBURN does not know the conductivity of the web into the first press, LILBURN fails to teach or suggest determining a water balance at each press in accordance with the water balance equation set forth in claim 2, as recited in claim 3. Further, Appellant notes that, while showing a number of equations, the Examiner has failed to show that the equations set forth by LILBURN render unpatentable the equations recited in claims 6 and 18. Further, Appellants submits that LILBURN's disclosure of a linear relationship between concentration of typical paper machine ions (disclosed by LILBURN as  $\text{Cl}^+$  or  $\text{SO}_3^{++}$ ) and conductivity fails to render unpatentable the recited relationship of claim 31 that, at papermaking pH, conductivity vs. *dissolved solids* is linear.

Accordingly, Appellant submits that, in addition to failing to teach or suggest the combination of features recited in at least independent claim 1, LILBURN likewise fails to render unpatentable the subject matter recited in at least claims 2, 3, 6, 18, and 31, such that these claims are separately patentable over LILBURN. Further, Appellant submits that claims 4 and 5 are allowable at least for the reason that these claims depend from allowable base claims and because these claims recite additional features that further define the present invention. In particular, Appellant submits that no proper modification of LILBURN teaches or suggests, *inter alia*, the dewatering is monitored in a press section, as recited in claim 4; and the press section includes at least one press, at least one felt, at least one suction box, at least one shower nozzle; and at least one press pan, and the process further comprises collecting water pressed out in the at least one press in the at least one press pan, collecting water from the at least one felt with the at least one suction box, wherein the collected water is water flowing out of the press section, spraying the at least one felt with water from the at least one shower nozzle, wherein the sprayed water is water flowing into the press section, and determining the water balance of the press section, which is indicative of the dewatering in the press section, as recited in claim 5.

Accordingly, Appellant requests that the Board reverse the Examiner's decision to finally reject claims 1 - 6, 18, and 31 under 35 U.S.C. § 103(a) and remand these claims. Appellant respectfully requests that the Examiner's decision to finally reject claims 1 - 6, 18,

and 31 under 35 U.S.C. § 103(a) be reversed, and that the application be remanded to the Examiner for withdrawal of the rejection over LILBURN and an early allowance of all claims on appeal.

**(B) The Rejection of Claims 7 - 17, 19 - 30, and 32 Under 35 U.S.C. § 103(a) Over LILBURN in view of LEWIS with or without JUSTUS or ELY, Sr. is in Error, the Rejection Should be Reversed, and the Application Should be Remanded to the Examiner.**

The Examiner asserts that the use of plural presses is well known from LEWIS or JUSTUS or ELY, and that it would have been obvious to perform the water balance of LILBURN in the press sections of LEWIS, JUSTUS, or ELY. The Examiner further asserts that the conductivity of wet web could be determined from the slurry of LEWIS prior to web formation. Appellant traverses the Examiner's assertions.

In establishing a *prima facie* case of obviousness under 35 U.S.C. § 103, it is incumbent upon the Examiner to provide a reason *why* one of ordinary skill in the art would have found it obvious to modify a prior art reference or to combine reference teachings to arrive at the claimed invention. *See Ex parte Clapp*, 227 USPQ 972 (BOARD OF PATENT APPEALS AND INTERFERENCES 1985) To this end, the requisite motivation must stem from some teaching, suggestion or inference in the prior art as a whole or from the knowledge generally available to one of ordinary skill in the art and not from Appellant's

disclosure. See, for example, *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir. 1988).

While the Examiner has asserted that the conductivity of the slurry of LEWIS *could be* determined, there is no teaching or suggestion that the conductivity of the slurry is in fact determined, nor is there any teaching or suggestion how such information would be utilized by LEWIS or how it would have been obvious to modify LILBURN based upon such utilization by LEWIS. Accordingly, Appellant submits that there is certainly no teaching or suggestion that it would have been obvious to modify LILBURN to utilize such a determination, particularly since LILBURN is specially designed to operate when the conductivity of the wet web entering the first nip is unknown. Thus, Appellant submits that the art of record fails to provide any suggestion as to how or why one ordinarily skilled in the art would be motivated to modify the operation of LILBURN in the manner asserted by the Examiner, particularly since there is no teaching or suggestion in the applied art as to how measuring conductivity before the first press would affect or change the calculation performed by LILBURN after the first press.

Thus, Appellant submits that the instant rejection is based, not upon fact based determinations of what would have been obvious to one ordinarily skilled in the art at the time of the invention, but rather upon an impermissible hindsight reconstruction of Appellant's invention after review of the instant disclosure and claims. It is respectfully

submitted that the courts have long held that it is impermissible to use Appellants' claimed invention as an instruction manual or "template" to piece together teachings of the prior art so that the claimed invention is purportedly rendered obvious. *See In re Fritch*, 972 R.2d 1260, 1266, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992).

As discussed above, LILBURN discloses a process that is specially designed to operate when the conductivity of the wet web, i.e., before the first press, is unknown. Thus, Appellant submit that, notwithstanding that a conductivity measurement *could be* made in LILBURN prior to the first press, the art of record fails to provide any reason as to *why* one ordinarily skilled in the art would perform such a measurement in conjunction with the LILBURN process. Accordingly, Appellant submits that, as the asserted modification would not benefit LILBURN, the asserted modification would not have been obvious to one ordinarily skilled in the art.

In this regard, Appellant notes that, even if modified, albeit improperly, in the manner asserted by the Examiner in the final Office Action, the LILBURN process will still be required to determine the conductivity of the wet web after the first nip in order to base all subsequent calculations. As such, Appellant submits that the art of record fails to suggest any benefit for LILBURN by determining the conductivity of the web entering the wet end section, as recited in at least independent claim 1.

Accordingly, Appellant submits that, notwithstanding the disclosure of LILBURN,

LEWIS, JUSTUS, and/or ELY, the art of record fails to provide the necessary motivation or rationale for modifying LILBURN in the manner asserted by the Examiner. Further, Appellant submits that the only reasonable rationale for modifying LILBURN in the manner asserted by the Examiner is found in reviewing Appellant's disclosure and through the use of impermissible hindsight.

Further still, Appellant submits that even if it is considered that the prior art document has been properly modified, which Appellant submits it has not, the applied art fails to teach or suggest the other various recited features of the process, which are set forth in the dependent claims. In particular, Appellant submits that, because no proper combination of LILBURN and LEWIS (with or without JUSTUS or ELY, Sr.), teaches or suggests determining a water balance after each press, particularly when the equations of claim 6 and 18 utilize input sheet gpm as a parameter, as recited in claims 7 and 19, nor is there any teaching or suggestion in any proper combination of the applied documents to measuring conductivity of the material suspension in the headbox, as recited in claims 8, 20, and 32. Moreover, Appellant submits that none of the applied documents, and certainly no proper combination of these documents teach or suggest sectionally collecting water and/or determining a cross-direction profile, as recited in claims 9 - 17 and 21 - 30.

Accordingly, Appellant submits that, in addition to failing to teach or suggest the combination of features recited in at least independent claim 1, no proper combination of

LILBURN in view of LEWIS with or without JUSTUS or ELY, Sr. renders unpatentable the subject matter recited in at least claims 7 - 17, 19 - 30, and 32, such that these claims are separately patentable over any proper combination of the applied art.

Accordingly, Appellant requests that the Examiner's decision to finally reject claims 7 - 17, 19 - 30, and 32 under 35 U.S.C. § 103(a) be reversed, and that the application be remanded to the Examiner for withdrawal of the rejection over LILBURN in view of LEWIS with or without JUSTUS or ELY, Sr. and an early allowance of all claims on appeal.

**(C) The Rejection of Claim 33 Under 35 U.S.C. § 103(a) Over LILBURN in view of BOSSEN is in Error, the Rejection Should be Reversed, and the Application Should be Remanded to the Examiner.**

The Examiner asserts that it would have been obvious to use nucleonic measurements, as disclosed by BOSSEN, to determine the water content of the web. Appellant traverses the Examiner's assertions.

Appellant notes that BOSSEN fails to teach or suggest any of the subject matter noted above as deficient in LILBURN. In particular, Appellant notes that BOSSEN fails to teach or suggest detecting the conductivity of the wet web *entering the wet end section*, as recited in at least independent claim 1, and certainly fails to suggest any manner of utilizing such information in practicing the invention of LILBURN.

Thus, as neither applied documents teaches or suggests at least the above-noted

features of the instant invention, Appellant submits that no proper combination of these documents can render unpatentable the combination of features recited in at least independent claim 1. Further, as BOSSEN fails to suggest any motivation or rationale for modifying LILBURN in any manner that would render the instant invention obvious, the asserted rejection is improper and should be withdrawn.

Further, Appellant notes that it is not apparent why one ordinarily skilled in the art would modify LILBURN in order to utilize the nucleonic measurements of BOSSEN, either in place of or in addition to the calculations already performed by LILBURN. In this regard, Appellants note that the Examiner's arguments fails to provide any motivation or rationale as to why one ordinarily skilled in the art would modify LILBURN in the manner asserted by the Examiner. Thus, Appellant submits that no proper combination of the applied art teaches or suggests, *inter alia*, water content of the wet web is calculated from a nucleonic measurement of fiber, water, and forming fabric minus the measured forming fabric minus the fiber weight, as recited in claim 33.

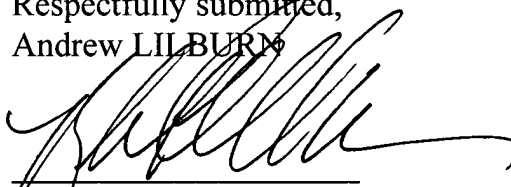
Accordingly, Appellant requests that the Examiner's decision to finally reject claims 33 under 35 U.S.C. § 103(a) be reversed, and that the application be remanded to the Examiner for withdrawal of the rejection over LILBURN in view of BOSSEN and an early allowance of all claims on appeal.

**(D) Conclusion**

Claims 1 - 7, 18, and 31 are patentable under 35 U.S.C. § 103(a) over LILBURN; claims 7 - 17, 19 - 30, and 32 are patentable under 35 U.S.C. § 103(a) over LILBURN in view of LEWIS with or without JUSTUS or ELY, Sr.; and claim 33 is patentable under 35 U.S.C. § 103(a) over LILBURN in view of BOSSEN. Specifically, the applied art of record fails to teach or suggest the unique combination of features recited in Appellant's claims 1 - 33. Accordingly, Appellants respectfully request that the Board reverse the Examiner's decision to finally reject claims 1 - 33 under 35 U.S.C. § 103(a) and remand the application to the Examiner for withdrawal of the rejection.

Thus, Appellant respectfully submits that each and every pending claim of the present application meets the requirements for patentability under 35 U.S.C. § 103(a), and that the present application and each pending claim are allowable over the prior art of record.

Respectfully submitted,  
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enclosure: Appendix (Claims on Appeal)

**CLAIMS ON APPEAL**

1. A process for monitoring dewatering in a wet end section of a web production machine, the process comprising:

measuring water flowing into the wet end section;

measuring water flowing out of the wet end section;

detecting conductivity of the wet web entering the wet end section;

measuring conductivity of the water flowing into wet end section;

measuring conductivity of water flowing out of the wet end section; and

determining a water balance from the measured quantities, which is indicative of dewatering in the wet end.

2. The process in accordance with claim 1, wherein the water balance is determined from the equation:

water flow ( $W_{in}$ ) x conductivity ( $C_{in}$ ) = water flow ( $W_{out}$ ) x conductivity ( $C_{out}$ ) .

3. The process in accordance with claim 2, wherein the water balance is determined after each press in the wet section.

4. The process in accordance with claim 1, wherein the dewatering is monitored in a press section.

5. The process in accordance with claim 4, wherein the press section includes at least one press, at least one felt, at least one suction box, at least one shower nozzle; and at

least one press pan, and the process further comprises:

collecting water pressed out in the at least one press in the at least one press pan;

collecting water from the at least one felt with the at least one suction box, wherein the collected water is water flowing out of the press section;

spraying the at least one felt with water from the at least one shower nozzle, wherein the sprayed water is water flowing into the press section; and

determining the water balance of the press section, which is indicative of the dewatering in the press section.

6. The process in accordance with claim 5, wherein the water balance in the press section is determined by the equations:

(1) Calculated shower water in Uhle flow = Uhle flow x [(sheet conductivity - Uhle conductivity)/(sheet conductivity - shower conductivity)];

(2) Calculated shower water in pan flow = Uhle flow x [(sheet conductivity - pan conductivity)/(sheet conductivity - shower conductivity)];

(3) Sheet water in Uhle flow = Uhle box total - shower flow in Uhle box;

(4) Sheet flow in pan flow = pan total - shower flow in pan;

(5) Exit sheet flow (gpm) = (inlet sheet gpm + shower gpm) - (press pan + Uhle box) gpm - (shower measured gpm - shower calculated gpm); and

(6) Exit sheet dryness = inlet fiber mass/(exit mass of water + fiber),

wherein the Uhle flow and conductivity is from the water collected at least one suction box..

7. The process in accordance with claim 6, wherein the press section comprises a plurality of presses, and the water balance is determined after each press.

8. The process in accordance with claim 6, further comprising measuring the conductivity of the material suspension in the headbox as the conductivity of the web flowing into the press section.

9. The process in accordance with claim 5, wherein at least one of the collected water from the press pan and the collected water from the suction box is collected sectionally in the cross-direction.

10. The process in accordance with claim 9, wherein the conductivity of the at least one sectionally collected water is sectionally determined.

11. The process in accordance with claim 10, wherein the press section includes a plurality of presses, and the water balance is determined sectionally after each press to create a cross-direction water removal profile.

12. The process in accordance with claim 11, wherein the press section includes at least one control unit to monitor the cross-direction water removal profile and selectively adjust parameters to optimize felt life.

13. The process in accordance with claim 11, further comprising measuring the

conductivity of the material suspension in the headbox as the conductivity of the web flowing into the press section.

14. The process in accordance with claim 13, wherein the conductivity and water flow of the web entering a subsequent press is calculated from the water balance.

15. The process in accordance with claim 9, wherein the collected water from the press pan and the collected water from the suction box are collected sectionally in the cross-direction, and the conductivity of the sectionally collected water is sectionally determined.

16. The process in accordance with claim 15, wherein a cross-direction profile of the sheet/shower water ratio in the at least one suction box is calculated to determine the cross-direction sheet water removal into the felt.

17. The process in accordance with claim 9, further comprising supplying a suspension from a headbox to form the wet web, wherein the determined conductivity of the wet web entering the wet section corresponds to the conductivity of the suspension in the headbox.

18. The process in accordance with claim 1, wherein the water balance in the wet end section is determined by the equations:

- (1) Calculated shower water in Uhle flow = Uhle flow x  $\left[ \frac{\text{sheet conductivity} - \text{Uhle conductivity}}{\text{sheet conductivity} - \text{shower conductivity}} \right]$ ;
- (2) Calculated shower water in pan flow = Uhle flow x  $\left[ \frac{\text{sheet conductivity} - \text{pan conductivity}}{\text{sheet conductivity} - \text{shower conductivity}} \right]$ ;

conductivity)/(sheet conductivity - shower conductivity)];

(3) Sheet water in Uhle flow = Uhle box total - shower flow in Uhle box;

(4) Sheet flow in pan flow = pan total - shower flow in pan;

(5) Exit sheet flow (gpm) = (inlet sheet gpm + shower gpm) - (press pan + Uhle box) gpm - (shower measured gpm - shower calculated gpm); and

(6) Exit sheet dryness = inlet fiber mass/(exit mass of water + fiber),

wherein the Uhle flow and conductivity are determined from the water collected at the at least one suction box.

19. The process in accordance with claim 16, wherein the wet end section comprises a plurality of presses, and the water balance is determined after each press.

20. The process in accordance with claim 16, further comprising measuring the conductivity of the material suspension in the headbox as the conductivity of the web flowing into the wet end section.

21. The process in accordance with claim 16, wherein at least one of the collected water from the press pan and the collected water from the suction box is collected sectionally in the cross-direction.

22. The process in accordance with claim 21, wherein the conductivity of the at least one sectionally collected water is sectionally determined.

23. The process in accordance with claim 22, wherein the wet end section includes

a plurality of presses, and the water balance is determined sectionally after each press to create a cross-direction water removal profile.

24. The process in accordance with claim 23, wherein the wet end section includes at least one control unit to monitor the cross-direction water removal profile and selectively adjust parameters to optimize felt life.

25. The process in accordance with claim 24, wherein the selectively adjustable parameters include vacuum strength, suction box slot size, nip loading in the press, and shower flow.

26. The process in accordance with claim 23, further comprising measuring the conductivity of the material suspension in the headbox as the conductivity of the web flowing into the wet end section.

27. The process in accordance with claim 23, wherein the conductivity and water flow of the web entering a subsequent press is calculated from the water balance.

28. The process in accordance with claim 20, wherein the collected water from the press pan and the collected water from the suction box are collected sectionally in the cross-direction, and the conductivity of the sectionally collected water is sectionally determined.

29. The process in accordance with claim 28, wherein a cross-direction profile of the sheet/shower water ratio in the at least one suction box is calculated to determine the cross-direction sheet water removal into the felt.

30. The process in accordance with claim 15, wherein the equation conductivity x water flow is additive.

31. The process in accordance with claim 1, wherein, at papermaking pH, conductivity versus dissolved solids is linear.

32. The process in accordance with claim 1, further comprising supplying a suspension from a headbox to form the wet web, wherein the determined conductivity of the wet web entering the wet section corresponds to the conductivity of the suspension in the headbox.

33. The process in accordance with claim 1, wherein water content of the wet web is calculated from a nucleonic measurement of fiber, water, and forming fabric minus the measured forming fabric minus the fiber weight.